

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-12 (cancelled).

13 (New). A wavelength division multiplex (WDM) optical system comprising:

a WDM combiner to provide a source signal;

at least one transmitter coupled to the WDM combiner, each transmitter providing a corresponding information signal;

a noise source; and

at least one filter coupled between said noise source and said WDM combiner, said filter being characterized by at least one stop band that blocks wavelengths corresponding to each information signal and at least one pass band that passes wavelengths not within the at least one stop band.

14 (New). The system of claim 13, wherein said noise source is a broadband noise source.

15 (New). The system of claim 13, wherein said filter comprises an optical notch filter.

16 (New). The system of claim 13, wherein the filter comprises:  
a WDM demultiplexer to provide a plurality of noise signals;  
a plurality of filters, each filter coupled to a respective noise signal of the plurality of noise signals; and  
a WDM multiplexer coupled through at least one filter of the plurality of filters to respective noise signals.

17 (New). The system of claim 13, wherein said WDM multiplexer is configured for selective decoupling from at least one of said respective noise signals.

18 (New). The system of claim 13, wherein the filter includes:  
a WDM demultiplexer to provide noise signals at a plurality of wavelengths; and  
a WDM multiplexer coupled to combine a zero signal at wavelengths corresponding to each information signal that is provided by a transmitter of the at least one transmitter, the WDM multiplexer being further coupled to combine a noise signal at each wavelength of the plurality of wavelengths not corresponding to an information signal that is provided by a transmitter of the at least one transmitter.

19 (New). The system of claim 13, further comprising:  
an amplifier; and  
an optical cable coupled to carry said source signal to the amplifier.

20 (New). The system of claim 13, further comprising:

a plurality of linked amplifiers; and

an optical cable coupled to carry said source signal to a first one of said linked amplifiers.

21 (New). The system of claim 13, wherein said noise source comprises an Erbium Doped Fiber Amplifier.

22 (New). The system of claim 13, wherein said noise source comprises means for providing a substantially constant spectral power density across a range of wavelengths in an output of said noise source.

23 (New). A WDM system configured for communicating a predetermined number of optical channel wavelengths, said predetermined number of optical channel wavelengths including a first number of utilized channel wavelengths and a second number of idler channel wavelengths, said system comprising:

at least one transmitter, each of said transmitters providing an associated information signal on a respective one of said utilized channel wavelengths;

at least one noise source;

at least one filter coupled to said noise source; said filter providing at least one noise signal, each of said noise signals on a respective one of said idler channel wavelengths; and

at least one WDM combiner for combining said information signals and said noise signals into a source signal.

24 (New). The system of claim 23, wherein said at least one filter provides a noise signal on each of said second number of idler channel wavelengths.

25 (New). The system of claim 23, said system further comprising:  
a transmission path for receiving said source signal; and  
at least one amplifier coupled to said transmission path, said amplifier being configured to amplify said predetermined number of channel wavelengths.

26 (New). The system of claim 25, wherein said at least one filter provides a noise signal on each of said second number of idler channels.

27 (New). The system of claim 25, said system comprising said first number of said transmitters, each said transmitters providing an information signal on an associated one of said first number of utilized channels.

28 (New). The system of claim 23, wherein said noise source is a broadband noise source.

29 (New). The system of claim 23, wherein said filter comprises an optical notch filter.

30 (New). The system of claim 23, wherein the filter comprises:

- a WDM demultiplexer to provide a plurality of said noise signals;
- a plurality of filters, each filter coupled to a respective noise signal of the plurality of said noise signals; and
- a WDM multiplexer coupled through at least one filter of the plurality of filters to respective noise signals.

31 (New). The system of claim 23, wherein the filter includes:

- a WDM demultiplexer to provide a plurality of said noise signals each at one of a plurality of wavelengths; and
- a WDM multiplexer coupled to combine a zero signal at wavelengths corresponding to each said information signal that is provided by a transmitter of the at least one transmitter, the WDM multiplexer being further coupled to combine each said noise signal at each wavelength of the plurality of wavelengths not corresponding to an information signal that is provided by a transmitter of the at least one transmitter.

32 (New). The system of claim 23, wherein said noise source comprises an Erbium Doped Fiber Amplifier.

33 (New). The system of claim 23, wherein said noise source comprises means for providing a substantially constant spectral power density across a range of wavelengths in an output of said noise source.

34 (New). A wavelength division multiplex (WDM) optical system comprising:  
a WDM combiner to provide a source signal;  
at least one transmitter coupled to the WDM combiner;  
a broadband noise source; and  
at least one filter coupled between said noise source and said WDM combiner.

35 (New). A method of providing a source signal in a wavelength division multiplex system, the source signal including a first number of utilized channel wavelengths and a second number of idler channel wavelengths, said method comprising:

providing at least one information signal on an associated one of said utilized channel wavelengths;

filtering noise from a noise source to provide at least one filtered noise signal on an associated one of said idler channel wavelengths; and

combining said at least one noise signal and said at least one information signal into the source signal.

36 (New). The method of claim 35, said method comprising providing said second number of said filtered noise signals, each on an associated one of said idler channels.

37 (New). The method of claim 35, said method comprising providing said first number of said information signals, each on an associated one of said utilized channels.

38 (New). The method of claim 35, said method comprises providing said first number of said information signals, each on an associated one of said utilized channels, and providing said second number of filtered noise signals, each on an associated one of said idler channels.

39 (New). The method of claim 35, wherein said first number of utilized channel wavelengths is less than a total number of channel wavelengths amplified by an optical amplifier in said system.

40 (New). The method of claim 35, said method further comprising:  
removing one of said noise signals from a selected one of said idler channel wavelengths;  
adding one of said information signals on said selected one of said idler channel wavelengths.

41 (New). The method of claim 35, wherein said noise source is a broadband noise source.

42 (New). The method of claim 35, wherein said filtering includes blocking signals at wavelengths within a stop band while passing optical signals at wavelengths not within the stop band.

43 (New). The method of claim 35, wherein said filtering includes:  
demultiplexing said noise from said noise source into a plurality of said noise signals ordered according to wavelength; and  
multiplexing at least one of said plurality of noise signals to provide said filtered noise signal.

44 (New). The method of claim 35, wherein said filtering includes:  
demultiplexing said noise from said noise source into noise signals at a plurality of wavelengths; and  
multiplexing a portion of said noise signals and a zero optical signal to become said filtered noise signal, said multiplexing comprising combining the zero optical signal at wavelengths corresponding to each said information signal of the at least one information signal and combining each said noise signal at each wavelength of the plurality of wavelengths not corresponding to an information signal of the at least one information signal.

45 (New). The method of claim 35, further comprising:  
coupling the source signal over an optical cable to an amplifier for amplifying the source signal.



46 (New). A method of providing a source signal in a wavelength division multiplex system, said method comprising:

- transmitting information at least one information signal;
- filtering noise from a noise source to provide a filtered noise signal; and
- combining the filtered noise signal and the at least one information signal into the source signal.